

# FDSE - Ensemble tools

## What is FDSE?

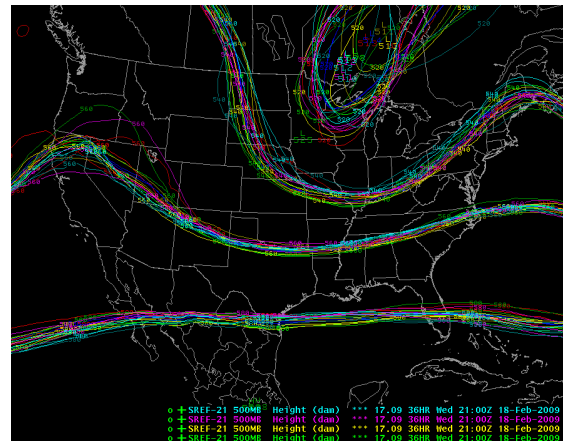
National Weather Service (NWS) forecasters must sift through large volumes of 4-dimensional data then efficiently generate forecasts based on that information. The ever-increasing volume of information challenges forecasters to view data pertinent to the given weather scenario. The Forecaster Decision Support Environment (FDSE) project explores new data management and processing capabilities to enhance situational awareness, allow forecasters to work more efficiently, and improve model ensemble capabilities in order to explore probabilistic forecast products. Efficiency improvements will allow forecasters to spend more time providing their customers Impact-based Decision Support Services.

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## FDSE - Ensemble Tools

Ensembles of computer weather forecasts, such as the NAM, GFS, ECMWF, UKMO, and CMC, contain valuable information about the complexity of the forecast, what might happen if a disturbance goes through, or not. Simple visual comparison of the various solutions takes seconds and immediately shows where model solutions disagree, implying high complexity. Event probabilities can be estimated by the fraction of the ensemble members predicting the event. Each of these insights to forecast complexity, alternative scenarios and event probabilities, are fundamental new capabilities enabling NWS forecasters to improve support decision-makers in weather-sensitive situations.

The Ensemble Tools include the basic displays used widely in practice and literature: spaghetti (thinned contours), plume (time series at a point or subarea), and histogram (distribution of forecast values at a point or subarea). Forecasters can “blend” the model guidances into a single “best” forecast including uncertainty statistics, based on weighting the ensemble members according to how well each member has performed historically. This information is an important input to the Short Term Update Tool.



## Goals and Impacts

- Enable forecasters to visualize forecast complexity
- Enable forecasters to quantify forecast complexity (e.g. Probability Density Functions)
- Enable forecasters to convey scientifically sound information about the complexity of the forecast in high-impact situations via event probabilities and alternative scenarios
- Improve forecaster efficiency via the Short Term Update Tool